

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
INDIANAPOLISOFFICE MEMORANDUM

Date: August 18, 2010

To: Mark Jaworski
Site Investigation SectionThru: Steve Buckel, Chief *8-18-10*
OLQ Chemistry Services Section
Science Services BranchFrom: Craig A. Pender *CAP 8/18/2010*
Environmental Chemist 2
OLQ Chemistry Services SectionJim Risch *JR 8-18-2010*
Environmental Chemist 1
OLQ Chemistry Services Section
Science Services BranchSubject: Hazardous Substances Associated with Specific Wastes
Gary Development
Gary, Lake Co., Indiana
Site # L58QW (0511336)

As requested, the following are specific wastes associated with Gary Development and the hazardous substances associated with them.

- Paint Sludge¹: Lead, Chromium, Cadmium, Barium, and Methyl Ethyl Ketone (MEK).
- Fly Ash²: Mercury, Arsenic, Boron, Cadmium, Lead, Selenium, Cobalt, Aluminum, Barium, Molybdenum, Antimony, Thallium, and Chromium.
- Herbicides³: 2,4-D, 2,4-DB, 2,4,5-TP (Silvex), 2,4,5-T, Dalapon, Dicamba, Dichloroprop, Dinoseb, MCPA, MCPP, 4-Nitrophenol, Pentachlorophenol, Acifluorfen, Bentazon, Chloramben, DCPA diacid, 3,5-Dichlorobenzoic acid, 5-Hydroxydicamba, and Picloram.
- Oily Waste from 6-stand Oil Recovery Unit: This waste did not match up with a specific EPA waste code or general waste type. Additional information regarding the generation of this waste (source facility or facilities, details of process, analytical

1 Taken from the document "Listing Background Document for Paint Manufacturing Listing Determination" for the USEPA Office of Solid Waste, dated December 15, 2000.

2 Taken from the document "Characterization of Coal Combustion Residues from Electric Utilities Using Wet Scrubbers for Multi-Pollutant Control", for the USEPA Office of Research and Development dated July 2008.

3 Taken from EPA Method SW846-8151A "Chlorinated Herbicides by GC using Methylation or Pentafluorobenzoylation Derivatization", Revision 1, December 1996.

data) is needed to identify specific hazardous substances that may be present in the waste.

- API Separator Bottoms (Oil Sludge)⁴: (EPA Waste Code K051) Acenaphthene, Anthracene, Benzo(a)Anthracene Benzene, Benzo(a)Pyrene, bis(2-Ethylhexyl)phthalate, Chrysene, Di-n-butyl phthalate, Ethylbenzene, Fluorene, Naphthalene, Phenanthrene, Phenol, Pyrene, Toluene, Xylenes, Cyanides (Total), Chromium (Total), Lead, and Nickel.
- EPA Waste Code F006⁵: Cadmium, Chromium (Total), Cyanides (Total), Cyanides (Amenable), Lead, Nickel, and Silver.
- EPA Waste Code K087 (Decanter Tank Tar Sludge)⁶: Benzene, Methyl Ethyl Ketone, Toluene, Xylenes, Acenaphthylene, Anthracene, Benzo(a)Anthracene, Benzenethiol, Benzo(b)Fluoranthene, Benzo(k)Fluoranthene, Benzo(a)Pyrene, Chrysene, Para-Cresol, Fluoranthene, Fluorene, Indeno(1,2,3-cd)Pyrene, Naphthalene, Phenanthrene, Phenol, Pyrene, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc, Cyanide, Fluoride, Sulfide, Styrene, Dibenzofuran, and 2-Methylnaphthalene.
- EPA Waste Code F001⁷: Tetrachloroethene, Methylene Chloride, Trichloroethylene, 1,1,1-Trichloroethane, Carbon Tetrachloride, Chlorinated Fluorocarbons.
- EPA Waste Code F002⁸: Tetrachloroethene, Methylene Chloride, Trichloroethylene, 1,1,1-Trichloroethane, Chlorobenzene, 1,1,2-Trichloro-1,2,2-Trifluoroethane, Ortho-Dichlorobenzene, Trichlorofluoromethane, and 1,1,2-Trichloroethane.
- EPA Waste Code F003⁹: Xylenes, Acetone, Ethyl Acetate, Ethyl Benzene, Ethyl Ether, Methyl Isobutyl Ketone, n-butyl alcohol, Cyclohexanone, and Methanol.
- EPA Waste Code F005¹⁰: Toluene, Methyl Ethyl Ketone, Carbon Disulfide, Isobutanol, Pyridine, Benzene, 2-Ethoxyethanol, and 2-Nitropropane.
- EPA Waste Code U147¹¹: 2,5-Furandione

4 Obtained from the Electronic Code of Federal Regulations (CFR)

5 Obtained from the Electronic Code of Federal Regulations (CFR)

6 Obtained from the document "Best Demonstrated Available Technology Background Document for K087", USEPA Office of Solid Waste dated May 1988

7 Obtained from the Electronic Code of Federal Regulations (CFR)

8 Obtained from the Electronic Code of Federal Regulations (CFR)

9 Obtained from the Electronic Code of Federal Regulations (CFR)

10 Obtained from the Electronic Code of Federal Regulations (CFR)

11 Obtained from the Electronic Code of Federal Regulations (CFR)

- EPA Waste Code U031¹²: 1-Butanol
- EPA Waste Code U112¹³: Acetic Acid Ethyl Ester
- EPA Waste Code U154¹⁴: Methanol
- EPA Waste Code D001¹⁵: Characteristic of Ignitability defined as:
 - (a) A solid waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:
 - (1) It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume and has flash point less than 60°C (140°F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D-93-79 or D-93-80 (incorporated by reference, see § 260.11), or a Setaflash Closed Cup Tester, using the test method specified in ASTM Standard D-3278-78 (incorporated by reference, see § 260.11), or as determined by an equivalent test method approved by the Administrator under procedures set forth in §§ 260.20 and 260.21
 - (2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard
 - (3) It is an ignitable compressed gas as defined in 49 CFR 173.300 and as determined by the test methods described in that regulation or equivalent test methods approved by the Administrator under §§ 260.20 and 260.21
 - (4) It is an oxidizer as defined in 49 CFR 173.151
 - (b) A solid waste that exhibits the characteristic of ignitability has the EPA Hazardous Waste Number of D001. [45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990]
- Asbestos¹⁶: Asbestos is the name given to a number of naturally occurring fibrous minerals with high tensile strength, the ability to be woven, and resistance to heat and most chemicals. Because of these properties, asbestos fibers have been used in a wide range of manufactured goods, including roofing shingles, ceiling and floor tiles, paper and cement products, textiles, coatings, and friction products such as

12 Obtained from the Electronic Code of Federal Regulations (CFR)

13 Obtained from the Electronic Code of Federal Regulations (CFR)

14 Obtained from the Electronic Code of Federal Regulations (CFR)

15 Obtained from the Electronic Code of Federal Regulations (CFR)

16 Obtained from the EPA website at: <http://www.epa.gov/asbestos/pubs/help.html>

automobile clutch, brake, and transmission parts. The Toxic Substances Control Act defines asbestos as the asbestiform varieties of chrysotile (serpentine); crocidolite (riebeckite); amosite (cummingtonite/grunerite); anthophyllite; tremolite; and actinolite.

- Corn Starch¹⁷: Corn Starch is not considered a hazardous substance.
- Aluminum Dross¹⁸: Primarily consists of Aluminum. However, may also contain a mixture of oxides (as Aluminum), mixture of nitrides, mixture of carbides, mixture of chlorides, and other impurities.
- Vegetable Oil¹⁹: Vegetable oil is not considered an environmental hazard.
- Activated Biological Sludge²⁰: Ammonia, Phosphorus, Sodium Thiocyanate, and Phenol.
- Phenolic Waste²¹: EPA waste codes P034 (Phenol, 2-cyclohexyl-4,6-dinitro-), P048 (Phenol, 2,4-dinitro-), P047 (Phenol, 2-methyl-4,6-dinitro-, & salts), P020 (Phenol, 2-(1-methylpropyl)-4,6-dinitro-), P009 (Phenol, 2,4,6-trinitro-, ammonium salt), P128 (Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester)), P199 (Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate), P202 (Phenol, 3-(1-methylethyl)-, methyl carbamate), P201 (Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate), U188 (Phenol), U048 (Phenol, 2-chloro-), U039 (Phenol, 4-chloro-3-methyl-), U081 (Phenol, 2,4-dichloro-), U082 (Phenol, 2,6-dichloro-), U089 (Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-), U101 (Phenol, 2,4-dimethyl-) U052 (Phenol, methyl-), U132 (Phenol, 2,2'-methylenebis (3,4,6-trichloro-)), U411 (Phenol, 2-(1-methylethoxy)-, methylcarbamate), U170 (Phenol, 4-nitro-), F021 (Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives), F023 (Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of Hexachlorophene from highly purified 2,4,5-trichlorophenol.)), and F027 (Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols (This listing does not include formulations containing

17 Taken from a MSDS for Corn Starch obtained from the website: http://www.naturalsourcing.com/msds/MSDS_Cornstarch.pdf

18 Taken from a Material Safety Data Sheet (MSDS) for Aluminum Dross obtained from the website: http://www.wisetalloys.com/MSDS/wise_msds_04.pdf

19 Taken from a Material Safety Data Sheet (MSDS) for Vegetable Oil obtained from the website: http://www.scholarchemistry.com/msds/Vegetable_Oil.pdf

20 Taken from a Material Safety Data Sheet (MSDS) for Activated Sludge obtained from the website: http://www.dofasco.ca/bins/doc.asp?rdc_id=140505

21 Obtained from the Electronic Code of Federal Regulations (CFR)

Hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.)).

- Foundry Baghouse Dusts²²: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Copper, Iron, Manganese, Nickel, Sodium, and Zinc.
- Wash Thinners²³: Acetone, Methyl Ethyl Ketone, Xylenes, n-Butyl Acetate, Isobutyl Alcohol, Glycol Ether, and Methyl Amyl Ketone.
- Caustic Sludge and Paint Washings²⁴: (EPA Waste Code K086). Acetone, Acetophenone, bis(2-Ethylhexyl) phthalate, n-Butyl alcohol, Butyl benzyl phthalate, Cyclohexanone, o-Dichlorobenzene, Diethyl phthalate, Dimethyl phthalate, Di-n-butyl phthalate, Di-n-octyl phthalate, Ethyl acetate, Ethylbenzene, Methanol, Methyl ethyl ketone, Methyl isobutyl ketone, Methylene chloride, Naphthalene, Nitrobenzene, Toluene, 1,1,1-Trichloroethane, Trichloroethylene, Xylenes, Chromium (Total), Cyanides (Total), and Lead.
- Soluble Oils²⁵: Hexahydro 1,3,5-Tris (2-Hydroxyethyl S-Triazine) and Triethanolamine.

22 Obtained from IDEM Guidance Document "Foundry Waste Classification Guidelines"

23 Taken from a Material Safety Data Sheet (MSDS) for Wash Thinner obtained from the website:
<http://www.maclac.com/Msds/Thinners/t-200.pdf>

24 Obtained from the Electronic Code of Federal Regulations (CFR)

25 Taken from a Material Safety Data Sheet (MSDS) for Soluble Cutting Oil obtained from the website:
<http://www.markylab.com/MSDS/CW.pdf>